INTERNATIONAL TELECOMMUNICATION UNION

WRC-2000 WORLD RADIOCOMMUNICATION CONFERENCE

Addendum 15 to Document 12-E 17 April 2000 Original: English

ISTANBUL, 8 MAY – 2 JUNE 2000

PLENARY MEETING

United States of America

PROPOSALS FOR THE WORK OF THE CONFERENCE

Agenda item 4 - in accordance with Resolution 95 (WRC-97), to review the resolutions and recommendations of previous conferences with a view to their possible revision, replacement or abrogation

Proposal to amend Resolution 127

Background information

The proposal herein amends Resolution 127 to take account of the current status of ITU-R studies on the compatibility of non-GSO MSS feeder links in bands around 1.4 GHz with services in the same and nearby bands; and to invite WRC-03 to consider allocations to non-GSO MSS feeder links in bands around 1.4 GHz on the basis of completed studies.

References: ITU-R Document 8D/251, ITU-R WP 8D/317, Attachment 4

Resolution 127, adopted at WRC-97, resolved that studies should be carried out as a matter of urgency on the operational and technical measures required:

i) to facilitate sharing between feeder links for non-GSO MSS systems and existing and currently planned services in portions of the band 1 390-1 400 MHz (Earth-to-space) and 1 427-1 432 MHz (space-to-Earth); and

ii) to protect passive services in the band 1 400-1 427 MHz from unwanted emissions from feeder links for non-GSO MSS systems;

and invited a future competent conference to consider, on the basis of completion of the above-mentioned studies, additional allocations for feeder links on a worldwide basis for non-GSO MSS systems with service links below 1 GHz.

Item 3.5 of Resolution 722, “Preliminary agenda for the 2001 World Radiocommunication Conference”, included an item on consideration of the results of studies related to additional allocations on a worldwide basis for feeder links in bands around 1.4 GHz to the non-geostationary mobile-satellite services with service links operating below 1 GHz, taking into account studies conducted in response to Resolution 127.

This proposal would amend Resolution 127 to have it call for allocations based on completion of studies on the agenda of WRC-03.

The rationale for including consideration of allocations to MSS feeder links near 1.4 GHz in the agenda of WRC-03 is that theoretical studies referred to in Resolution 127 have been completed and accepted, and that the remaining hardware demonstrations are planned for completion prior to the convening of WRC-03.

Therefore, WRC-03 will likely have before it the technical and sharing measures, and sharing and compatibility studies that would enable it to consider additional allocations around 1.4 GHz to non-GSO MSS for feeder links.

The studies performed to date indicate that out-of-band emissions from MSS feeder links at 1 390-1 393 MHz (up), and 1 429-1 432 MHz (down) into the band 1 400-1 427 MHz, which is allocated on a primary basis exclusively to sensitive, passive science services, can be reduced through the use of highly efficient modulation methods such as GMSK, and through careful design, which will keep intermodulation products out of that neighbouring band.

Those studies now have a certain measure of acceptance from the science services themselves (Document ITU-R 8D/251). The current or remaining concerns of these services - radio astronomy, Earth exploration-satellite (passive), and space research (passive) - are whether the results indicated by theory and preliminary measurement and testing can be achieved throughout the life of operational spacecraft. It is these latter tests, among others, that are planned to be available before WRC-03 convenes.

If the additional tests and measurements are persuasive, but the item was not previously put on the agenda of WRC-03 by WRC-2000, then the conference would not be competent to consider those allocations.

If the additional tests and measurements that would be conducted between now and the convening of WRC-03 are not persuasive, and the item is on its agenda, then WRC-03 would not, in its good judgement, make any such allocations, even though it was competent to do so. In other words, putting the item on the preliminary agenda of WRC-03 is both foresighted and “fail-safe”.

Supporting information

A detailed discussion of the compatibility of feeder links around 1.4 GHz with the science services in a nearby band can be found in the Chairman’s Report of the April 1999 WP 8D meeting, ITU-R Document WP 8D/317, Attachment 4.

MOD USA/12/287

RESOLUTION 127 (WRC-~~97~~2000)

Studies relating to consideration of allocations in bands around 1.4 GHz for feeder links of the non-geostationary-satellite systems in the mobile-satellite service with service links operating below 1 GHz

The World Radiocommunication Conference (~~Geneva, 1997~~Istanbul, 2000),

considering

MOD USA/12/288

a) that the agenda of ~~this Conference~~WRC-97 included consideration of the adoption of additional allocations for the non-geostationary (non-GSO) mobile-satellite ~~systems in the mobile-satellite~~ service (MSS);

MOD USA/12/289

b) that the Report of the 199~~7~~9 Conference Preparatory Meeting (CPM-9~~7~~9) stated that the Radiocommunication Bureau has identified ~~at least 23~~25 non-GSO MSS networks as of 26 November 1999 at frequencies below 1 GHz, at some stage of coordination under Resolution **46 (Rev.WRC-97)**, and that many of the proposed networks cannot be implemented in the existing allocations because there is not enough spectrum;

c) that CPM-97 stated that due to the extreme sensitivity of radio astronomy observations interference from unwanted (spurious and out-of-band) emissions can be a problem, but also noted that interference to radio astronomy can be avoided using various techniques including low-power transmitter levels, choice of modulation, bit shaping, output filtering and band limiting filters, the use of which can minimize the band separation necessary to meet the recommended interference threshold levels for out-of-band emissions;

SUP USA/12/290

d)

MOD USA/12/291

~~*e*~~*d)* that factors taken into account by ~~these~~ post-CPM-97 activities in order to protect the passive services around 1.4 GHz from out-of-band emissions include: the use of narrow-band non-GSO MSS feeder-link transmissions; the use of spectrum-efficient modulation methods, such as Gaussian filtered minimum shift keying, having inherently rapid roll-off of out-of-band emissions; the use, where necessary, of band-pass filters in satellite transmitters and MSS feeder-link transmitting earth stations; and guardbands where necessary;

MOD USA/12/292

~~f~~e) that factors taken into account by ~~these~~ post-CPM-97 activities concerning sharing with the radiolocation service include the use of conventional techniques that may be applied in MSS satellite receivers, such as intermediate frequency limiters and time diversity, which have long been employed to protect radiolocation receivers, and techniques such as transmitted waveforms employing time diversity, which have been employed to protect receivers in other services from high-power pulsed radar transmitters~~,~~;

MOD USA/12/293

~~d~~f) that, since CPM-97, ~~one administration has~~ITU studies have been carried out ~~additional analyses and hardware demonstrations~~containing theoretical analyses with a view to determining ~~the feasibility of sharing between~~if the operation of non-GSO MSS feeder links ~~and services such as~~in bands around 1.4 GHz would be compatible with the Earth exploration-satellite (passive), radio astronomy and space research (passive) services ~~in bands around 1.4 GHz~~;

ADD USA/12/294

g) that the theoretical analyses have indicated that sufficient reduction of out-of-band and spurious emissions could be achieved to protect the sensitive science services in nearby bands;

ADD USA/12/295

h) that additional tests and measurements of feeder-link transmissions from systems having the characteristics, performance, and reliability of equipment that would be used in operational systems are necessary;

ADD USA/12/296

i) that such additional tests and measurements will be completed prior to WRC-03,

recognizing

that the bands near 1.4 GHz are extensively used by many other services operating in accordance with the Radio Regulations, including fixed and mobile services,

noting

a) that Resolution **214 (Rev.WRC-97)** states under *resolves* 1. that further studies are urgently required on operational and technical means to facilitate sharing between non-GSO MSS and other radiocommunication services having allocations and operating below 1 GHz;

SUP USA/12/297

b)

c)

MOD USA/12/298

~~d~~b) that, since WRC-95, ~~one administration has performed~~ITU-R studies have been carried out on sharing between space and terrestrial services and feeder links near 1.4 GHz for non-GSO MSS systems with service links below 1 GHz,

resolves

MOD USA/12/299

1 to invite ITU-R, as a matter of urgency, to continue studies, and to carry out additional tests and demonstrations to validate the studies ~~to determine the~~on operational and technical measures required to facilitate sharing in portions of the band 1 390-~~1 400~~1 393 MHz between existing and currently planned services and feeder links (Earth-to-space) for non-GSO MSS systems with service links operating below 1 GHz;

MOD USA/12/300

2 to invite ITU-R, as a matter of urgency, to carry out additional tests and demonstrations to validate the studies ~~to determine~~on operational and technical means to facilitate sharing, in portions of the band ~~1 427~~1 429-1 432 MHz, between existing and currently planned services and feeder links (space-to-Earth) for non-GSO MSS systems with service links operating below 1 GHz;

MOD USA/12/301

3 to invite ITU-R, as a matter of urgency, to ~~study operational and technical measures required~~carry out additional studies, including the measurement of emissions from equipment that would be employed in operational systems to protect passive services in the band 1 400-1 427 MHz from unwanted emissions from feeder links near 1.4 GHz for non-GSO MSS systems with service links operating below 1 GHz;

MOD USA/12/302

4 to invite ~~a future competent conference~~*WRC-03 to consider, on the basis of completion of studies referred to in *resolves* 1, 2 and 3, additional allocations for feeder links on a worldwide basis for non-GSO MSS systems with service links below 1 GHz,

urges administrations

to participate actively in such studies, with the involvement of interested parties.

Reasons: To take account of the current status of ITU-R studies on the compatibility of non-GSO MSS feeder links in bands around 1.4 GHz with services in the same and nearby bands, and to invite WRC-03 to include in its agenda consideration of allocations to non-GSO MSS feeder links in bands around 1.4 GHz.